

# Turbo Molecular Pump [UTM-FH/FW Series]

The UTM-FH and UTM-FW is compound turbo molecular using 5 axis magnetic levitation and digital controlled, and realized advantages such as high performance and reliability and energy savings.

The UTM-FH series, which has improved compression ratio for hydrogen, is high back pressure and high compression type and for light to middle processes. The UTM-FW series is wide range and high flow type and for high load process and middle to hard processes.



UTM-1400FW

## Features

- ▶ Abundant variations from 350L/s to world's largest 6300L/s (digital magnetic controlled bearing type).
- ▶ Maintainable stable pumping performance against change of back pressure (FH series).
- ▶ Optional internal heating system to control rotor temperature and reduce adhesion of side reaction by-products (FW series).
- ▶ Excellent anti-corrosion surface treatment (excluding 3303FH and 6300FH). Optional special surface treatments (e.g. Nickel plating + cation electrodeposition, special deposited film, aluminum anodization) are available as necessary.
- ▶ Mountable in all direction.
- ▶ Variable speed system makes it possible to change the pumping speed in the range from 25% through 100%.
- ▶ There is no limitation to combine any power supply and pump main unit to change cable length because of using coupling free system and tuning free system.
- ▶ Self power generation by regenerative energy is used for backup power supply at power outage by using battery free system. Troublesome battery replacement is not necessary.
- ▶ Built-in monitoring/self-diagnostic and communication functions enable to configure centralized monitoring system.
- ▶ Safety design with fracture energy absorption construction can reduce damage on vacuum system when trouble happened with the pumps.

- ▶ High durability and high reliability have been realized by experiments such as air rushing-in testing, various touching down testing, forced destruction testing for rotor and foreign material drop testing (Si wafer fall).

## Applications

### [UTM-FH series]

- ▶ Main evacuation of light to middle processes such as evaporator, sputtering system, dry etching, etc. where there are not any side reaction by-products
- ▶ Pumping system of analytical instrument, R&D system, laboratory equipment, etc.
- ▶ Pumping system for those equipment and system for light gas such as H<sub>2</sub> and He
- ▶ Multiple turbo molecular pumps with centralized back pump configuration

### [UTM-FW series]

- ▶ Main evacuation of middle to hard processes such as dry etching, CVD system, etc.
- ▶ High flow gas evacuation for dry etching, CVD system, sputtering system, etc.
- ▶ Main evacuation of analytical instrument, R&D system, laboratory equipment, etc.

# Turbo Molecular Pump [UTM-FH/FW Series]

## Specifications

### UTM-FH Series

Model			UTM-350FH			UTM-480FH			UTM-800FH			
Flange size	Inlet/Outlet		VG100	ICF152	NW25	VG150	ICF203	VG150	ICF203			
	Pumping speed *1 *2	L/sec	N <sub>2</sub> H <sub>2</sub>	350 320	330 310		480 340	480 340	810 530	740 520	→	
Ultimate pressure *1 *3	Pa								10 <sup>-8</sup>		→	
	Torr								10 <sup>-10</sup>		→	
	mbar								10 <sup>-10</sup>		→	
Max. compression rate *1 *3	N <sub>2</sub>								> 10 <sup>9</sup>		→	
	H <sub>2</sub>								> 10 <sup>9</sup>		→	
Max. pressure at inlet of N <sub>2</sub> (at Max. flow) *1 *4	Water cooled [Air cooled]	Pa							18.0 [7.0 × 10 <sup>-1</sup> ]		→	
		Torr							1.3 × 10 <sup>-1</sup> [5.2 × 10 <sup>-3</sup> ]		→	
		mbar							1.8 × 10 <sup>-1</sup> [7.0 × 10 <sup>-3</sup> ]		→	
Max. pressure at outlet of N <sub>2</sub> (at Max. flow) *1 *4	Water cooled [Air cooled]	Pa							180 [50]		→	
		Torr							1.4 [3.8 × 10 <sup>-1</sup> ]		→	
		mbar							1.8 [5.0 × 10 <sup>-1</sup> ]		→	
Max. flow rate of N <sub>2</sub> *4	Water cooled	SCCM							1100 [260]		→	
Max. flow rate of Ar *4	[Air cooled]	SCCM							480 [110]		→	
Rotational speed	rpm								36000		→	
Acceleration time	min								Approx. 4		→	
Deceleration time	min								Approx. 4		→	
Bearing type	5 axis magnetic levitation and digital control											
Rotor blade surface treatment	Ni plating											
Baking temperature	°C (F)		≤ 120 (≤ 248)									
Cooling	Water cooled/Air cooled											
Cooling water port	Rc3/8											
Flow rate of cooling water	L/min		≥ 3									
Pressure drop of cooling water between inlet and outlet	MPa		≥ 0.05									
Gas purge port	NW10											
Flow rate of gas purge	SCCM		10						25			
Weight	kg		Approx. 17						Approx. 28			
Recommended backing vacuum pump *5	m <sup>3</sup> /h		17						48			
	L/min		290						800			
	CFM		10						28			
Noise level	dBA		64						65			
Power consumption	kVA		0.6						0.9			
Input voltage (frequency)	ACV [Hz]								200 to 240 [50/60]			
Phase (Motor drive system)	Single (VWVF)											
Output frequency	Hz		750						600			
Ambient temperature	°C (F)		0 to 40 (32 to 104)									
Weight	kg		Approx. 10									
Conformity standard	CE											

### UTM-FW Series

Model			UTM-350FW			UTM-480FW			UTM-800FW			
Flange size	Inlet/Outlet		VG100	ICF152	NW25	VG150	ICF203	VG150	ICF203			
	Pumping speed *1 *2	L/sec	N <sub>2</sub> H <sub>2</sub>	350 320	330 310		480 340	480 340	810 530	740 520	→	
Ultimate pressure *1 *3	Pa								10 <sup>-7</sup>		→	
	Torr								10 <sup>-9</sup>		→	
	mbar								10 <sup>-9</sup>		→	
Max compression rate *1 *3	N <sub>2</sub>								> 10 <sup>9</sup>		→	
	H <sub>2</sub>								> 10 <sup>9</sup>		→	
Max. pressure at inlet of N <sub>2</sub> (at Max. flow) *1 *4	Water cooled [Air cooled]	Pa							38.0 [1.2]		→	
		Torr							2.8 × 10 <sup>-1</sup> [9.0 × 10 <sup>-3</sup> ]		→	
		mbar							3.8 × 10 <sup>-1</sup> [1.2 × 10 <sup>-2</sup> ]		→	
Max. pressure at outlet of N <sub>2</sub> (at Max. flow) *1 *4	Water cooled [Air cooled]	Pa							290 [70]		→	
		Torr							2.1 [5.2 × 10 <sup>-1</sup> ]		→	
		mbar							2.9 [7.0 × 10 <sup>-1</sup> ]		→	
Max. flow rate of N <sub>2</sub> *4	Water cooled	SCCM							1800 [370]		→	
Max. flow rate of Ar *4	[Air cooled]	SCCM							700 [170]		→	
Rotational speed	rpm								36000		→	
Acceleration time	min								Approx. 4		→	
Deceleration time	min								Approx. 4		→	
Bearing type	5 axis magnetic levitation and digital control											
Rotor blade surface treatment	Ni plating											
Baking temperature	°C (F)		≤ 120 (≤ 248)									
Cooling	Water cooled/Air cooled											
Cooling water port	Rc3/8											
Flow rate of cooling water	L/min		≥ 3									
Pressure drop of cooling water between inlet and outlet	MPa		≥ 0.05									
Gas purge port	NW10											
Flow rate of gas purge	SCCM		10						25			
Weight	kg		Approx. 17						Approx. 28			
Recommended backing vacuum pump *5	m <sup>3</sup> /h		17						48			
	L/min		290						800			
	CFM		10						28			
Noise level	dBA		64						65			
Power consumption	kVA		0.6						0.9			
Input voltage (Input frequency)	ACV [Hz]								200 to 240 [50/60]			
Phase (Motor drive system)	Single (VWVF)											
Output frequency	Hz		750						600			
Ambient temperature	°C (F)		0 to 40 (32 to 104)									
Weight	kg		Approx. 10									
Conformity standard	CE											

Note: The values in the table are representative of actual measurement values and are not guaranteed.

\*1 These are values measured according to the JVIS005, or calculated values based on these measured values.

\*2 Without the protecting metal net.

\*3 A digit number is expressed.

	UTM-1001FH		UTM-3303FH	UTM-6300FH
	VG200	ICF253	VG350	VG500
	1000	NW40	3300	6300
	570		2400	5000
		10 <sup>-8</sup>		
		10 <sup>-10</sup>		
		10 <sup>-10</sup>		
	> 10 <sup>9</sup>		> 10 <sup>11</sup>	> 10 <sup>10</sup>
	3 × 10 <sup>4</sup>		9 × 10 <sup>4</sup>	4 × 10 <sup>4</sup>
	18.0 [7.0 × 10 <sup>-1</sup> ]		9.0 [-]	6.4 × 10 <sup>-1</sup> [-]
	1.3 × 10 <sup>-1</sup> [5.2 × 10 <sup>-3</sup> ]		6.7 × 10 <sup>-2</sup> [-]	4.8 × 10 <sup>-3</sup> [-]
	1.8 × 10 <sup>-1</sup> [7.0 × 10 <sup>-3</sup> ]		9.0 × 10 <sup>-2</sup> [-]	6.4 × 10 <sup>-3</sup> [-]
	180 [50.0]		210 [-]	160 [-]
	1.4 [3.8 × 10 <sup>-1</sup> ]		1.5 [-]	1.2 [-]
	1.8 [5.0 × 10 <sup>-1</sup> ]		2.1 [-]	1.6 [-]
	1100 [260]		1800 [-]	1400 [-]
	480 [110]		1100 [-]	1400 [-]
	36000		22200	16800
	Approx.6		Approx.12	Approx.30
	Approx.10		Approx.16	Approx.40
	5 axis magnetic levitation and digital control			
	Ni plating			
	Non treatment			
	≤ 120 (≤ 248)			
	Water cooled/Air cooled		Water cooled	
	Rc3/8			
	≥ 3			
	≧ 0.05			
	≧ 7.25			
	NW10		Non	
	25			
	Approx.28		Approx.86	
	48		90	
	800		1500	
	28		52.9	
	65		55	
	0.9		1.6	
	200 to 240 [50/60]			
	Single (VWF)			
	600		370	
	0 to 40 (32 to 104)			
	Approx.10			
	CE			

Digital Power Supply (Type D3)

Unit: mm

Front Panel: 210 mm width, 149 mm height, 4-φ4.5 holes, 26 mm hole offset, 5 mm hole offset, 2.3 mm hole offset.

Side Panel: 400 mm width, 130 mm height, 25 mm hole offset, 200 or more mm hole offset.

Back Panel: 198 mm width, 130 mm height, 30 or more mm hole offset, BREAKER ON/OFF SWITCH.

[Output cable]  
 Connection cable for connecting the turbo molecular pump to the power supply.  
 Standard cable length is 3m (9.8ft).  
 Longer 6m and 10m (32.8ft) cables are also available and other lengths available upon request.  
 Special order range is 1 to 10m. (3.3 to 32.8ft)

	UTM-1001FW		UTM-1400FW			UTM-2300FW			UTM-3301FW	
	VG200	ICF253	VG250	VG200	ICF253 NW40	VG300	VG250	ICF305	VG350	
	1000	1000	1490	1360	1300	2730	2230	2110	3300	
	570	570	890	860	860	1850	1720	1700	2400	
		10 <sup>-7</sup>		10 <sup>-8</sup>				10 <sup>-7</sup>		
		10 <sup>-9</sup>		10 <sup>-10</sup>				10 <sup>-9</sup>		
		10 <sup>-9</sup>		10 <sup>-10</sup>				10 <sup>-9</sup>		
				> 10 <sup>9</sup>					> 10 <sup>8</sup>	
	4 × 10 <sup>3</sup>		6 × 10 <sup>3</sup>	13.0 [-]		9 × 10 <sup>3</sup>		8 × 10 <sup>3</sup>	8.0 [-]	
	38.0 [1.2]		13.0 [-]	9.7 × 10 <sup>-2</sup> [-]		7.0 [-]		6.0 × 10 <sup>-2</sup> [-]	8.0 [-]	
	2.8 × 10 <sup>-1</sup> [9.0 × 10 <sup>-3</sup> ]		1.3 × 10 <sup>-1</sup> [-]	1.3 × 10 <sup>-1</sup> [-]		5.2 × 10 <sup>-2</sup> [-]		7.0 × 10 <sup>-2</sup> [-]	6.0 × 10 <sup>-2</sup> [-]	
	3.8 × 10 <sup>-1</sup> [1.2 × 10 <sup>-2</sup> ]		240 [-]	240 [-]		7.0 × 10 <sup>-2</sup> [-]		180 [-]	8.0 × 10 <sup>-2</sup> [-]	
	290 [70]		1.8 [-]	1.8 [-]		1.3 [-]		1.3 [-]		
	2.1 [5.2 × 10 <sup>-1</sup> ]		2.4 [-]	2.4 [-]		1.8 [-]		1.8 [-]		
	2.9 [7.0 × 10 <sup>-1</sup> ]		1400 [-]	1400 [-]		1500 [-]				
	1800 [370]		1000 [-]	1000 [-]		Water cooled : 1350		Water cooled : 1300		
	700 [170]		32100	32100		24600		21600		
	36000		Approx. 7	Approx. 7		Approx. 9		Approx. 12		
	Approx. 6		Approx. 7	Approx. 7		Approx. 9		Approx. 16		
	Approx. 10		5 axis magnetic levitation and digital control							
	Ni plating									
	≤ 120 (≤ 248)									
	Water cooled/Air cooled		Water cooled							
	Rc3/8									
	≥ 3									
	≧ 0.05									
	≧ 7.25									
	NW10		NONE							
	25		50							
	Approx. 28		Approx. 36			Approx. 60			Approx. 90	
	48		800		1500		90		53	
	28		63		62		58		2.0	
	65		1.2		1.3		58		2.0	
	0.9		1.2		1.3		58		2.0	
	200 to 240 [50/60]									
	Single (VWF)									
	600		535		410		360			
	0 to 40 (32 to 104)									
	Approx. 10									
	CE									

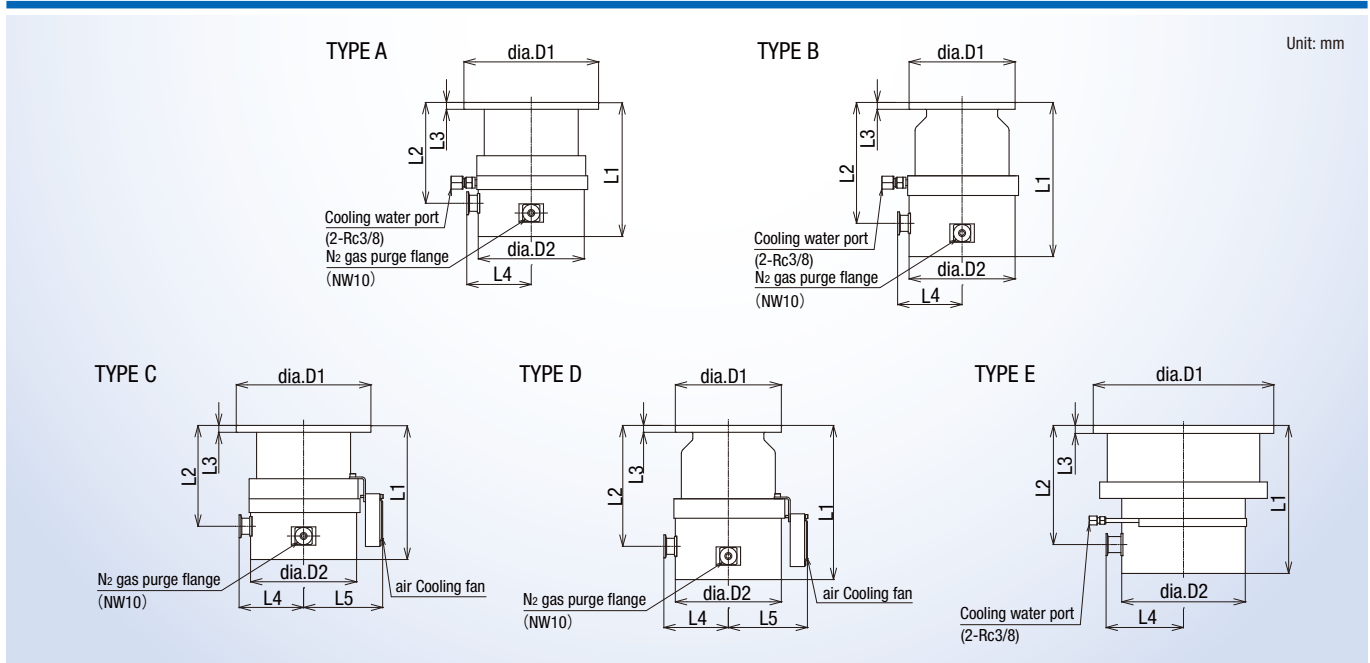
\*4 These are values measured under the condition of standard surface treatment, and measured with standard backing pump.

When continuous long term operation near the maximum inlet port pressure will be maintained, please consult the manufacturer (JVISO05 standard item).

\*5 Select a suitable, larger capacity pump depending on the gas flow rate.

# Turbo Molecular Pump [UTM-FH/FW Series]

## Dimensions



## Dimensions

Model	Spec	Cooling	Inlet Flange	Outlet Flange	L1	L2	L3	L4	L5	φD1	φD2	Type
UTM-350FH/UTM-350FW	Water cooled		VG100	NW25	269	211	12	112.5	—	185	185	B
			ICF152		276	218	21	112.5	—	152	185	B
	Air cooled	VG100	269		211	12	112.5	138	185	185	D	
		ICF152	276		218	21	112.5	138	152	185	D	
UTM-480FH/UTM-480FW	Water cooled		VG150	NW25	234	176	12	112.5	—	235	185	A
			ICF203		234	176	22	112.5	—	203	185	A
	Air cooled	VG150	234		176	12	112.5	138	235	185	C	
		ICF203	234		176	22	112.5	138	203	185	C	
UTM-800FH/UTM-800FW	Water cooled		VG150	NW40	310	241	12	143	—	235	208	B
			ICF203		324	255	22	143	—	203	208	B
	Air cooled	VG150	310		241	12	143	157	235	208	D	
		ICF203	324		255	22	143	157	203	208	D	
UTM-1001FH/UTM-1001FW	Water cooled		VG200	NW40	278	209	16	143	—	300	208	A
			ICF253		278	209	25	143	—	253	208	A
	Air cooled	VG200	278		209	16	143	157	300	208	C	
		ICF253	278		209	25	143	157	253	208	C	
UTM-1400FW	Water cooled		VG250	NW40	300	229	16	158	—	350	238	A
			VG200		300	229	16	158	—	300	238	A
			ICF253		331	260	25	158	—	253	238	B
UTM-2300FW	Water cooled		VG300	NW40	340	268	20	182	—	400	265	A
			VG250		375	303	16	182	—	350	265	B
			ICF305		395	323	28	182	—	305	265	B
UTM-3301FW	At cooling water		VG350	NW40	376	297	20	193	—	450	318	A
UTM-3303FH	At cooling water		VG350	NW40	369	297	20	193	—	450	308	E
UTM-6300FH	At cooling water		VG500	NW40	414	327	22	240	—	625	414	E

Note: External dimension, such as size of exhaust port, etc, will be changed when ordering optional internal heating system. And an additional dedicated control unit will be necessary. Please contact us for the detailed information.

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